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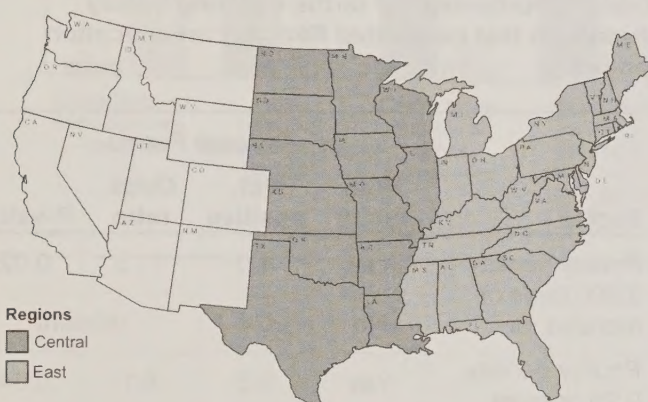
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Respiratory Disease on Breeder-Chicken Farms in the United States

Breeder-chicken farms consist of primary breeders whose progeny are breeding birds, and multipliers whose progeny are broilers and table-egg layers. Breeder farms provide the genetics for the poultry industry, and the birds on these farms are very valuable. Therefore, it is crucial to prevent disease introduction that could threaten the farms' genetic stock.

The USDA's National Animal Health Monitoring System (NAHMS) conducted a study of breeder-chicken farms in 2010. A total of 482 breeder farms located in the Central and East regions of the United States participated in the study (see map). The study questionnaire addressed potential risk factors for respiratory disease relating to farm surroundings, farm/house characteristics, human traffic, birds and other animals on the farm, and bird/egg movement and transport.

Poultry 2010 Regions



reported MG, Newcastle disease, infectious coryza, or avian influenza in their last completed flock. MS, ILT, and infectious bronchitis occurred in the last completed flock on 2.0, 1.8, and 0.9 percent of breeder farms, respectively (table 1). ILT did not occur in breeder flocks in the Central region (table 1) or in primary breeder flocks (table 2). Table-egg type breeder farms had no occurrences of MS or ILT in the last completed flock (table 3).

Table 1. Percentage of farms that had the following respiratory diseases in the last completed flock, by region

Respiratory disease	Percent Farms		
	Region		
	Central	East	All farms
<i>Mycoplasma synoviae</i> (MS)	1.6	2.1	2.0
Infectious laryngotracheitis (ILT)	0.0	2.4	1.8
Infectious bronchitis	1.1	0.8	0.9
Any	2.7	5.2	4.6

Table 2. Percentage of farms that had the following respiratory diseases in the last completed flock, by farm type

Respiratory disease	Percent Farms	
	Farm Type	
	Primary breeder	Multiplier
<i>Mycoplasma synoviae</i> (MS)	3.8	1.8
Infectious laryngotracheitis (ILT)	0.0	2.1
Infectious bronchitis	2.6	0.7
Any	6.4	4.4

Occurrence of respiratory disease

Breeder farms placed hens in the laying house at 20.9 weeks of age and removed them at 64.1 weeks of age, on average. Breeder farms reported the occurrence of specific diseases in the last completed flock, including the following respiratory diseases: *Mycoplasma synoviae* (MS), *Mycoplasma gallisepticum* (MG), infectious laryngotracheitis (ILT), Newcastle disease, infectious bronchitis, infectious coryza, and avian influenza. Respiratory disease occurred rarely (4.6 percent of last completed flocks). No breeder farms

Table 3. Percentage of farms that had the following respiratory diseases in the last completed flock, by breeder farm type

Respiratory disease	Percent Farms	
	Breeder Farm Type	
	Broiler	Table egg
<i>Mycoplasma synoviae</i> (MS)	2.0	0.0
Infectious laryngotracheitis (ILT)	1.9	0.0
Infectious bronchitis	0.9	2.5
Any	4.7	2.5

MS was the only respiratory disease problem in the last completed flock that any breeder farms ranked as moderate or severe (table 4). Slight problems with ILT and infectious bronchitis were reported.

Table 4. Percentage of breeder farms by severity of respiratory disease problems in the last completed flock

Respiratory disease	Percent Breeder Farms			
	Severity			
	Severe	Moderate	Slight	None
<i>Mycoplasma synoviae</i> (MS)	0.7	0.5	0.8	98.0
Infectious laryngotracheitis (ILT)	0.0	0.0	1.8	98.2
Infectious bronchitis	0.0	0.0	0.9	99.1

Risk factors associated with respiratory disease

Figure 1 and table 5 show factors related to area/farm location that were associated with the occurrence of respiratory disease in the last completed flock. Each factor was evaluated individually against the outcome of respiratory disease. Results are presented as odds ratios. The odds ratio is the likelihood of having respiratory disease for farms with the factor compared with farms without the factor. A higher percentage of farms located in counties with a high density of birds (poultry) and poultry farms had respiratory disease in the last completed flock compared with farms in counties with lower densities of poultry or farms (OR=11.6 and 8.1 respectively). Additionally, a higher percentage of farms within 1 mile of another commercial poultry operation had respiratory disease than farms that were

not in such close proximity to another commercial operation (OR=15.3). A higher density of poultry could potentially increase the pathogen load as well as opportunities for exposure to pathogens.

Figure 1. Percentage of farms with respiratory disease in last completed flock, by area/location factors

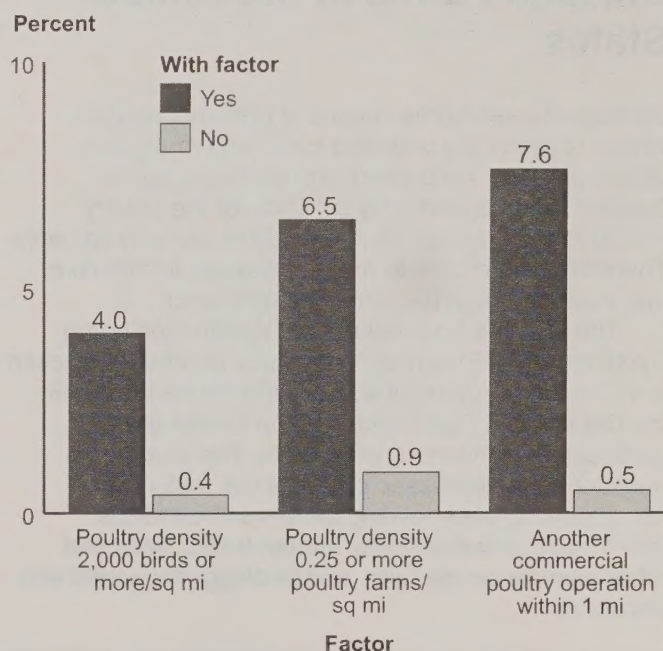


Table 5. Percentage of farms with respiratory disease in last completed flock, by area/location factors

Factor	Percent Farms			
	With factor	Pct. positive	Odds ratio	P-value
Poultry density 2,000 birds or more/sq mi	Yes	4.0	11.6	0.02
	No	0.4	referent	
Poultry density 0.25 or more poultry farms/sq mi	Yes	6.5	8.1	0.04
	No	0.9	referent	
Another commercial poultry operation within 1 mi	Yes	7.6	15.3	0.003
	No	0.5	referent	

Biosecurity practices also impact respiratory occurrence on breeder farms. Spraying tires of feed-delivery vehicles was associated with a reduced risk of respiratory disease, while allowing the feed deliverer to enter the poultry house, using catch crews that catch for other companies, and using buggies to load egg flats onto trucks that were used on other farms were all associated with an increased risk (table 6, figure 2). Although nearly all farms that used buggies on different farms cleaned and disinfected the buggies between farms (97.6 percent), it may be difficult to thoroughly remove all contamination on buggies, particularly on the wheels.

Figure 2. Percentage of farms with respiratory disease in last completed flock, by biosecurity characteristics

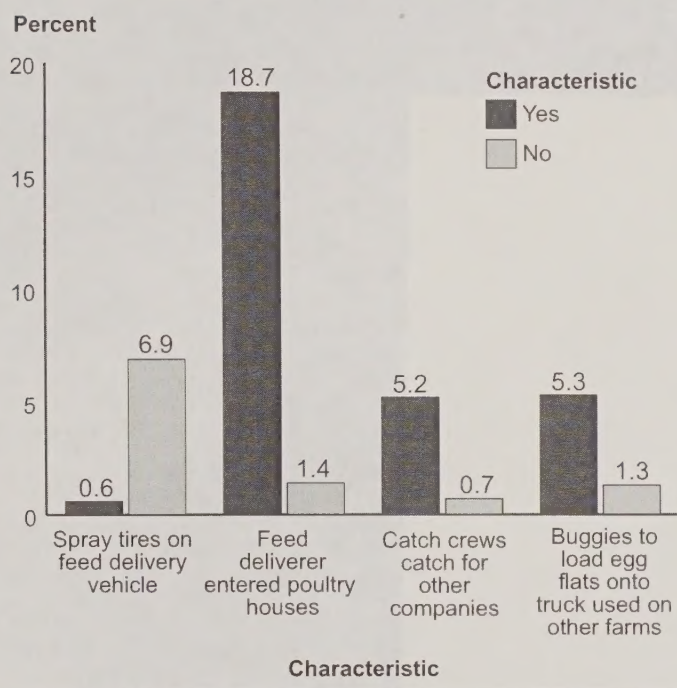


Table 6. Percentage of farms with respiratory disease in last completed flock, by biosecurity characteristics

	Percent Farms			
Characteristic	Character -istic	Pct. positive	OR	P
Spray tires of feed delivery vehicle before entering farm	Yes	0.6	referent	
	No	6.9	11.3	0.007
Feed deliverer entered poultry houses in previous 12 months	Yes	18.7	16.4	0.007
	No	1.4	referent	
Catch crews catch for other companies	Yes	5.2	7.9	0.01
	No	0.7	referent	
Buggies to load egg flats onto truck used on other farms	Yes	5.3	4.4	0.03
	No	1.3	referent	

Summary

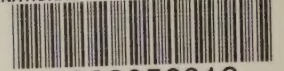
Movements of people and vehicles were the most important factors related to occurrence of respiratory disease on poultry breeder farms. Breeder farms located in poultry-dense areas need to be especially vigilant about biosecurity measures to prevent introduction of respiratory diseases to their farms.

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